Tolerable Upper Intake Levels
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Dietary Reference Intake Research Synthesis Workshop

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Safety: A Point on a Continuum

Risk Science

Society → Culture → Politics → Law → Economics

Unsafe (0) Safe (100)
Definition and Criteria

- "highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the general population"
- "systematic series of scientific considerations and judgments"
- "explicit in all of the evaluations and judgments made"

Requirements to Establish ULs

1. Clear Objectives
2. Good Models
3. Sufficient Data

Models

- Risk Assessment
- Risk/Risk
- Safe Levels
- Biological Mechanisms
Data Needs

- Dose-Response
- Exposure
  - Sub-populations
  - Upper Percentiles of Consumption
  - Long-term Exposure
- Clinical Biomarkers

Research Needs

- Translation of Animal Data to Human Health Outcomes
- Chronic and Acute Studies
  - Difficult to Study Chronic Disease Outcomes
  - Need More Studies on Chronic Disease Outcomes to Reduce Important Knowledge Gaps
- Prioritize and Communicate Research Needs
  - Database to Help Researchers Tailor Projects to Address the Most Critical Needs

More Research Needs

- Interactions of Multiple Nutrients and Health Endpoints
- Improved Risk/Risk Models
Integrating ULs With Risk Analysis

- ULs restrict dietary recommendations and regulatory policy options
- Many nutrients and foods are associated with multiple risk curves, some increasing and some decreasing with increased consumption
- ULs should be considered as one piece of a broader risk management strategy